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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,106	05/05/2005	Kunihiro Ichimura	OPC-C511	7016

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EXAMINER	
JOHNSON, CONNIE P	
ART UNIT	PAPER NUMBER
1795	

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12/24/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/520,106	ICHIMURA ET AL.	
	Examiner	Art Unit	
	CONNIE P. JOHNSON	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 September 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *15-26,28,29,32,33,35 and 36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *15-26,28,29,32,33,35 and 36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The remarks and amendment filed 9/11/2008 have been entered and fully considered.

2. Claims 15-26, 28-29, 32-33 and 35-36 are presented.

3. Claim 34 is cancelled per applicants' request.

Claim Rejections - 35 USC § 103

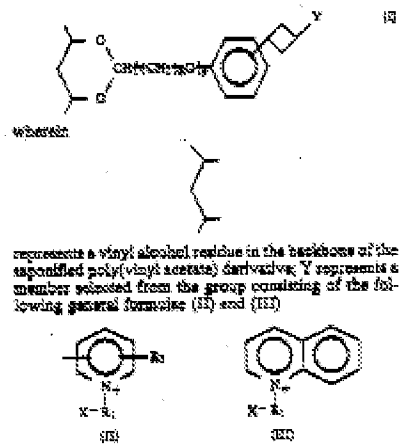
5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 15-19, 21-24, 26, 28-29, 32-33 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichimura et al., U.S. Patent No. 4,891,300 in view of Fansler et al., U.S. Patent Publication No. 2004/0241480 A1 and further in view of Ushirogouchi et al., U.S. Patent No. 5,691,101.

Ichimura teaches a photosensitive composition comprising a styrylpyridinium salt compound, a polyvinyl acetate derivative and a light polymerizable ethylenically unsaturated compound (col. 6, lines 63-67 and col. 7, lines 1-39). Example 1 shows that the polyvinyl acetate derivative is dissolved in water (col. 7, lines 54-57). The composition also comprises the polymerizable ethylenic unsaturated compound in the

presence of an acid catalyst (col. 7, lines 23-39) and a sensitizer (col. 4, lines 29-34). The photosensitive unit comprises a polyvinyl alcohol and styrylpyridinium group as in instant claim 22 (see column 2, figure 1).



The polyvinyl acetate in the backbone comprises a vinyloxy group. Examples of the styrylpyridium compounds include N-methyl-4-(p-formyl-styryl)pyridium methosulfate (col. 7, lines 14-22). Ichimura also teaches a method of forming a pattern. The method comprises preparing a resin emulsion composition and coating the film on a screen printing plate. In example 1, the polyvinyl acetate derivative (100g), styrylpyridinium compound (10g), 2,4-diethylthioxane (2g) (sensitizer) and p-dimethylaminobenzoate (4g) (photopolymerization initiator) are mixed and coated on a screen printing plate. The composition is heated to 60^0C and stirred overnight prior to coating on the screen printing plate. The composition was dried and irradiated with light. After exposure, the composition was developed with water (see example 1, column 8). The water used in development is neutral water and therefore has a pH of 7.0. Ichimura does teach a

photosensitive composition. Further, the reaction between the polyvinyl alcohol and the styrylpyridium salt compound is a photocrosslinking reaction. Ichimura does not teach an acid former and sensitizer in the form of particles in the composition.

However, Fansler teaches a photosensitive composition comprising a polyvinylalcohol and a photoacid generator dispersed therein (page 3, [0031 and 0032]). Therefore, the photoacid generator is present in the form of particles. The photoacid generators form a degree of dehydration of the polyvinylalcohol (page 4, [0046]). The composition may also comprise photosensitizers with the photoacid generators in the composition (page 4, [0047]). The photoacid generators form acid in the composition and increase sensitivity to actinic radiation. Ichimura teaches the same (col. 6, lines 31-35). It would have been obvious to one of ordinary skill in the art to use the photoacid generator particles of Fansler in the composition of Ichimura because the photoacid generators of Fansler are known to increase sensitivity and are insoluble in polyvinylalcohol resins and therefore would form particles when dispersed in the composition.

Ushirogouchi, in analogous art teaches a photosensitive composition comprising (col. 2, lines 29-33):

a. a resin that is acid-crosslinkable (negative working) or acid-decomposable (positive working)

b. an acid generator

c. a compound in the form of powder

The compound in the form of a powder is a light-absorbing pigment (col. 8, lines 64-67). Ushirogouchi teaches that the acid generated in the composition acts as an acid catalyst for the crosslinking reaction. The acid generator is present in an amount of 0.01 to 20 parts by weight with respect to the total solid content (col. 6, lines 40-45). In a photosensitive composition with pigment particles, a portion of each particle remains unirradiated with light. However, the acid catalyst combines with the portion of the pigment particles that is unirradiated to form the crosslinking reaction (col. 11, lines 1-15). Although not exemplified, Ichimura teaches a crosslinkable ethylenically unsaturated compound in the presence of an acid catalyst (Ichimura, col. 7, lines 23-39). Therefore, it would have been obvious to one of ordinary skill in the art to use the pigment particles of Ushirogouchi in the composition of Ichimura to absorb radiation and form a crosslinked reaction with the acid generator.

7. Claims 15 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichimura et al., U.S. Patent No. 4,891,300 in view of Fansler et al., U.S. Patent Publication No. 2004/0241480 A1 and Ushirogouchi et al., U.S. Patent No. 5,691,101 and further in view of Kawamura et al., U.S. Patent No. 6,465,146 B1.

Ichimura teaches a photosensitive composition comprising a styrylpyridinium salt compound, a polyvinyl acetate derivative and a light polymerizable ethylenically unsaturated compound as relied upon above (col. 6, lines 63-67 and col. 7, lines 1-39). The composition also comprises a dispersion of a photoacid generator and sensitizer. Ichimura does not teach that the pigment and photoacid generator particles have a particle size of 1.5μm or less.

However, Kawamura teaches a radiation-sensitive composition comprising pigment particles (sensitizer) with a particle diameter of 0.01 to 10 μm (col. 8, lines 53-55). The particle size of the pigment particles is advantagous to the uniformity of the dispersion in the radiation-sensitive layer. Kawamura also teaches a photoacid generator in the composition (col. 4, lines 64-66). It would have been obvious to one of ordinary skill in the art to use a particle size of 0.01 to 10 μm for the sensitizer and photoacid generator of Ichimura because Kawamura teaches that the particle size is conventional to stabilize and provide uniformity in the radiation-sensitive layer.

8. Claims 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichimura et al., U.S. Patent No. 4,891,300 in view of Fansler et al., U.S. Patent Publication No. 2004/0241480 A1 and Ushirogouchi et al., U.S. Patent No. 5,691,101 and further in view of Ichimura et al., U.S. Patent No. 4,777,114.

Ichimura teaches a photosensitive composition comprising a styrylpyridinium salt compound, a polyvinyl acetate derivative and a light polymerizable ethylenically unsaturated compound as relied upon above (col. 6, lines 63-67 and col. 7, lines 1-39). Ichimura ('300) does not teach that the composition comprises an aqueous emulsion of a hydrophobic polymer.

However, Ichimura ('114) teaches a photosensitive resin emulsion comprising a film-forming resin and a protective colloid (abstract). The photosensitive resin emulsion comprises a photosensitive unit and a saponified polyvinyl acetate derivative with a hydrophobic unit bonded to the backbone (col. 2, lines 57-67). The photosensitive unit comprises a polyvinyl alcohol and styrylpyridinium group. The aqueous emulsion

increases storage stability of the photosensitive composition when only water is used as the solvent. The photosensitive composition of Ichimura ('300) also comprises water as the solvent. Therefore, it would have been obvious to one of ordinary skill in the art to use an aqueous emulsion in the compositon of Ichimura ('300) to increase storage stability of the composition.

Response to Arguments

9. Applicant's arguments filed 9/11/2008 have been fully considered but they are not persuasive.

10. Applicant argues that the photosensitive composition of Ichimura undergoes photodimerization and photoradical-polymerization while the photosensitive composition in the present application undergoes an acid-catalyzed photocrosslinking reaction of a water-soluble resin by an insolubilizing agent.

Ichimura teaches a photosensitive resin composition comprising a saponified poly(vinyl acetate) derivative, a styrylpyridinium salt compound and a polymerizable ethylenically unsaturated compound, such as N-methylolacrylamide or N-methylolmethacrylamide (col. 6, lines 60-67 and col. 7, lines 1-39). The photosensitive composition also comprises a sensitizer. The styrylpyridinium salt compound and the polymerizable ethylenically unsaturated compound are introduced into the photosensitive resin composition in the presence of an acid catalyst (col. 7, lines 37-39). In addition, Ichimura teaches that the poly(vinyl acetate) derivative, combined with first and second photosensitive groups, a polymerizable ethylenic unsaturated compound and a photopolymerization initiator forms a tight photocrosslinking composition (col. 6,

lines 26-60). Therefore, Ichimura does teach an acid-catalyzed photocrosslinking reaction. The N-methylolacrylamide and N-methylolmethacrylamide are representative of an insolubilizing agent.

11. Applicant argues that Ichimura does not teach an acid former, a sensitizer in the form of particles and an acid-insolubilizing agent.

Ichimura teaches that the styrylpyridinium salt compound and the polymerizable ethylenically unsaturated compound are introduced into the photosensitive resin composition in the presence of an acid catalyst (col. 7, lines 37-39). Although not exemplified, Ichimura does teach that the components of the photosensitive composition are combined in the presence of an acid-catalyst. Ichimura also teaches a sensitizer and insolubilizing agent in the photosensitive composition (col. 4, lines 29-35 and col. 7, lines 37-38). Fansler, in analogous art is used to show a photoacid generator in the form of particles to increase sensitivity to actinic radiation. Ushirogouchi is used to show pigment particles in a photosensitive composition form a crosslinking reaction with the acid generator.

12. Applicant argues that Ichimura does not teach an acid former.

Ichimura teaches the photosensitive composition comprises an acid catalyst (col. 7, lines 37-39). Although not exemplified by specific examples, Ichimura does teach an acid catalyst in the photosensitive composition.

13. Applicant argues that Ichimura does not teach an "acid-reactive insolubilizing agent." Further, that if Examiner regards the photopolymerization initiator, such as ethyl

p-dimethylaminobenzoate, as an acid former, is in error because the photopolymerization initiators are basic compounds.

Ichimura teaches compounds, such as N-methylolacrylamide and N-methylolmethacrylamide in the photosensitive composition. The N-methylolacrylamide and N-methylolmethacrylamide are representative of an insolubilizing agent in present claim 17 (col. 7, lines 37-39). In addition, the photopolymerization initiator is used in combination with the insolubilizing agent to facilitate the photo-radical reaction (see applicants' specification, page 23, [0059]).

14. Applicant argues that Ichimura does not exemplify a photosensitive composition comprising a styrylpyridinium salt compound, a polyvinyl alcohol derivative and an ethylenically unsaturated compound. Further, that the styrylpyridinium salt compound and ethylenically unsaturated compound are grafted to the PVA and are therefore, not capable of crosslinking by irradiated light.

Examiner disagrees. According to applicants' specification, "the term "acid-reactive insolubilizing agent" as used herein is intended to refer to a compound which causes dehydrative condensation reactions, addition reactions, cationic polymerization reactions, etc. by the catalytic action of the acid generated by the activation radiation, so that water-soluble resin contained in the composition is insolubilized through crosslinking, polymerization, etc… In particular, it is preferred that the insolubilizing agent be acid-catalytically bonded to the main chain or side chain cites of the water-soluble resin" (page 17, [0035]). In example 1 of Ichimura, 100g of a saponified polyvinyl acetate derivative was dissolved in water, followed by adding N-methyl-4-(p-

formyl-styryl—pyridinium methosulfate and N-methylolacrylamide to the polyvinyl acetate mixture. Therefore, Ichimura teaches that the polyvinyl acetate derivative, N-methyl-4-(p-formyl-styryl—pyridinium methosulfate and N-methylolacrylamide are separate compounds that are added to the PVA. The N-methyl-4-(p-formyl-styryl—pyridinium methosulfate and N-methylolacrylamide are bonded to the PVA after the addition of the components separately. Therefore, the photosensitive composition of Ichimura is capable of forming a crosslinking reaction. In addition, applicant is directed to col. 6, lines 10-25 wherein Ichimura teaches that the first photosensitive group (the styrylpyridinium salt compound) is used to effectively photocrosslink the second photosensitive sensitive group (the insolubilizing agent).

15. Applicant argues that even if it were obvious to use the sensitizer particles of Fansler in the composition of Ichimura that the hypothetical composition would still lack an acid former and an acid-reactive insolubilizing agent.

Ichimura teaches a photosensitive composition comprising a polyvinyl acetate derivative, a styrylpyridinium salt compound, a sensitizer (col. 4, lines 29-35), an acid catalyst (acid former) and a polymerizable ethylenically unsaturated compound (acid-reactive insolubilizing agent) (col. 7, lines 1-50). Therefore, Ichimura does teach an acid former and an acid-reactive insolubilizing agent.

16. Applicant argues that Fansler does not teach a sensitizer in the form of particles in a radiation-sensitive resin composition.

Fansler teaches that the acid donor layer comprises a photoacid generator and a polymer (page 3, [0033]). The acid donor layer also comprises a photosensitizer with the photoacid generator to increase radiation sensitivity (page 4, [0047]). The photoacid generator may be dispersed in the acid donor layer (page 33, [0033]). A dispersed photoacid generator is in the form of particles. Although Fansler may not teach that the polymer in the acid donor layer is a resin, Fansler is used to teach a photoacid generator in the form of particles in a photosensitive composition.

17. Applicant argues that Fansler teaches the PVA polymer film and the acid generator in separate layers of a polarizer. Further, that the generated acid that diffuses into the PVA polymer film is not in the form of particles.

Fansler is used to show a photoacid generator in the form of particles in a photosensitive composition. Fansler teaches the acid donor layer comprises a photoacid generator dispersed in the acid donor layer and a photosensitizer. Although Fansler teaches a PVA polymer film is in a separate layer, the acid donor layer also comprises a polymer matrix. In addition, Fansler teaches that the photoacid generator may be dispersed in the acid donor the layer. A dispersion of the photoacid generator is in the form of particles (page 4, [0041]). Therefore, whether or not the photoacid generator particles disperse does not matter because Fansler teaches that the photoacid generator in the acid donor layer may also be in a dispersion.

18. Applicant argues that Fansler teaches a solid polymer layer adjacent to the PVA layer. Further, that the photoacid generator dispersed in the solid polymer is not photosensitive.

Fansler teaches the acid donor layer comprises a polymer, photoacid generator and a photosensitizer (page 4, [0047]). Therefore, the acid donor layer of Fansler is photosensitive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CONNIE P. JOHNSON whose telephone number is (571)272-7758. The examiner can normally be reached on 7:30am-4:00pm Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Connie P. Johnson
Examiner
Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795